What is claimed is

~~Patent Claims~~

1. Process for recognition of vehicle lane markings from image data, thereby characterized, that the morphological characteristics of dot-shaped vehicle lane markings are evaluated on the basis of *a priori* knowledge.

2. Process according to Claim 1, thereby characterized, that from the totality of the image data, areas are extracted for processing, in which vehicle lane markings (ROI, regions of interest) are contained with high probability based upon *a priori* knowledge.

3. Process according to Claim 2, thereby characterized, that the a priori knowledge is based upon the input of the camera geometry and/or the geometry of the vehicle track and/or the dimensions of the vehicle lane markings and/or the vehicle position.

4. Process according to Claims 2-3, thereby characterized, that in the initialization of the process for recognition of vehicle lane markings model parameters are varied at random sequence so long until vehicle lane markings are found.

5. Process according to Claim 4, thereby characterized, that the model parameter draws upon the width of the vehicle lane and/or the orientation of the camera with respect to the center of the vehicle lane and/or the yaw angle of the vehicle.

6. Process according to Claims 2-5, thereby characterized, that for repositioning of the already initialized ROI parameter predictions, a vehicle street model based on a prediction of

an evaluation process is drawn upon for parameter determination.

7. Process according to Claim 6, thereby characterized, that the evaluation process for parameter determination is based upon a Kalman-filter.

8. Process according to one of Claims 6-7, thereby characterized, that in the repositioning of the ROI, its values are controlled by the variation of the result values of the prediction of the Kalman-filter, when the width is adapted proportionally to the size of the variation of the results.

9. Process according to one of Claims 2-8, thereby characterized, that the ROI is limited vertically on the basis of a minimal and a maximal distance in the street plane.

10. Process according to Claim 9, thereby characterized, that in particular in application of the process at night, the vertical limitation of the ROI is determined by the area of the maximal illumination (high beam, low beam).

11. Process according to one of Claims 9-10, thereby characterized, that the limitation is controlled by the number of the image points expected to be associated with the vehicle lane marker, and this control or regulation is optimal when the number of the image points to be expected is constant for all distance ranges.

12. Process according to one of Claims 1-11, thereby characterized, that for processing of the areas (ROI) extracted from the image data, a matched-filter is employed

in order to extract image points (pixels), which are associated with vehicle lane markers.

13. Process according to Claim 12, thereby characterized, that the matched-filter is adapted in shape and size to the vehicle lane marking being searched for and/or to the statistic of the background.

14. Process according to one of Claims 12-13, thereby characterized, that the matched-filter is implemented in separate form, in which the x-y-components are presented separately.

15. Process according to one of Claims 12-14, thereby characterized, that in the framework of the use or application of the matched-filter, the average gray value of the background in the environment of the position to be examined is measured, and that upon the presentation of an image point, which is potentially to be associated with the vehicle lane marking, is closed or enclosed or concentrated on the basis of a comparison between background noise, the average gray value in the environment, and the gray value of the position to be examined.

16. Process according to one of Claims 12-15, thereby characterized, that in the evaluation of the matched-filter, only the x-component is evaluated.

17. Process according to one of Claims 12-16, thereby characterized, that after the extraction of the image points (pixel), which are to be associated with vehicle lane markings, these are digitized, wherein the intensities of the individual pixels are compared with a threshold value,

and the pixels are only then drawn upon for further evaluation when their intensity exceeds this threshold.

18. Process according to Claim 17, thereby characterized, that the threshold value is determined from the background noise using a threshold value regulator or controller.

19. Process according to Claim 18, thereby characterized, that the threshold value regulator draws upon *a priori* knowledge regarding the expected surfaces occupied by the vehicle lane markings, which are directly correlated with the expected number of image points (pixels) associated with the vehicle lane markings, and wherein the threshold value regulator or controller thereupon aims to supply the number of the image points extracted in the ROI preferably exactly to this expected value.

20. Process according to one of Claims 1-19, thereby characterized, that after the extraction of image points potentially belonging to a vehicle lane marker and the subsequent digitization, these image points are collected for the further processing into marker objects.

21. Process according to one of Claims 1-20, thereby characterized, that in the evaluation of the morphological characteristics of the vehicle lane marker, the size of the marking object (pixel group) and/or the roundness of the pixel group and/or the distribution of the pixels or, as the case may be, the number of empty spaces within the pixel group (compactness, clustering) is evaluated with respect to whether they satisfy the criteria of a vehicle lane marker defined in accordance with *a priori* knowledge.

22. Process according to Claim 21, thereby characterized, that each pixel group, which satisfies the criteria of a vehicle lane marker, is considered to be an actual marker object and is characterized by its image coordinates.

23. Process according to Claim 22, thereby characterized, that as characterizing image coordinates, the coordinates of the center of gravity of the pixel group associated with the marking object is selected.

24. Process according to one of Claims 20-23, thereby characterized, that the characteristic image coordinates of the marking object are employed in order with curve regression to describe the boundaries of the own vehicle lane with respect to the course of the vehicle track, as well as to describe the own position with respect to the vehicle lane center, and that this description is provided to an estimation process for parameter determination (for example, a Kalman-filter) for repositioning of the ROI within the image data.